H. ACKERMAN,
DEALER IN FIRST CLASS
PIANOS, ORGANS
And Sewing Machines.
No. 30 SOUTH MAIN STREET,
MARION, - - OHIO.

A. C. CAMMON.

Albany, N. Y.

FACTORY & WAREROOMS, COR. BROADWAY & NORTH FERRY ST.

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McCAMMON PIANO FORTES.

HOW THEY ARE MADE.

Perhaps we cannot present to the public a more interesting article on manufacturing, than to give an idea of piano-forte making. Piano-fortes, in these days, making an almost indispensable article of furniture in every dwelling; adding so much to the pleasure of home, and being so much of a companion in all home hours; contributing so largely to the enjoyments of society, that some little knowledge of the processes of making, and the materials used, must be not only interesting to all, but valuable to those who may wish to know how good piano-fortes should be made.

The McCammon manufactory is situated cor. Broadway and North Ferry streets, Albany, N. Y., occupying the end of a block, presenting a front on three streets of 513 feet, the main building of which, fronting on three streets 363 feet, is built of brick, four stories high, above a high basement story, devoted exclusively to machinery driven by a fifty horse power engine. The completeness of design of these buildings and machinery for the purpose used, we believe, has no superior, if any equal, in this country. Every improvement and convenience is attached to make the entire perfect, and in going through the premises one is attracted by the comprehensiveness of the whole concern.

You pass into the yard, and are surprised at the large amount of lumber of all kinds piled up in the rough state.

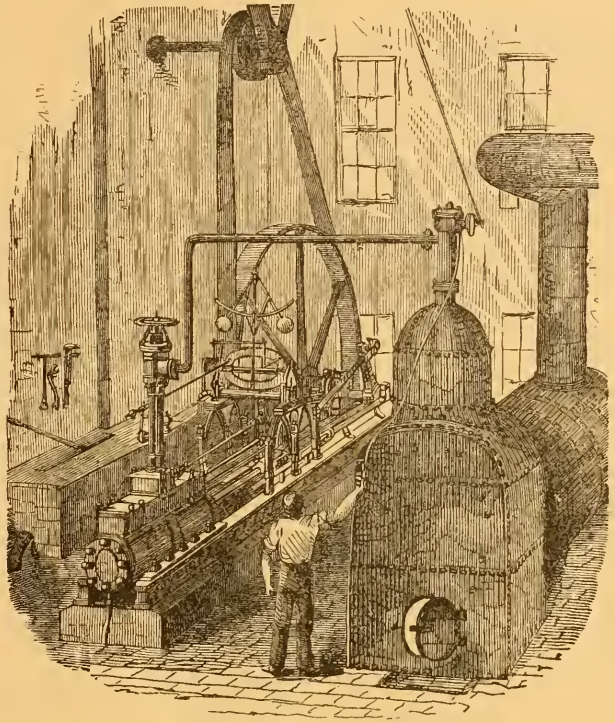
The yard is full, and also the large sheds used as drying sheds for lumber.

The most of our lumber is cut for us in the forests of the Alleghany, Oneida and Herkimer and other choice localities in New York and Canada, and delivered by contract a long time after being sawed, when well seasoned.

The variety and number of different kinds of wood used in the business is quite surprising. Pine, spruce, maple, oak, chestnut, ash, bass-wood, walnut, cherry, mahogany, birch, rosewood, ebony, whiteholly, apple, pear-tree, white wood and several other varieties, each of which has its peculiar qualities, and its place in the piano depends on the duties it has to perform. The inspecting and selecting of the lumber require the strictest attention, long experience, and matured judgment; for it must be not only of the right kind, and free from all imperfections, such as knots, shakes, sapwood, &c., but it must also be well seasoned. All the lumber used by us, being cut two or three years, in advance, is seasoned before we receive it, then it is piled up and dried another year, at least, in our yard, after which it goes into the machine shop and is cut up in proper forms and sizes wanted, and then put into the drying room from six months to two years before it is used in the piano-forte.

These drying-rooms, of which there are three in the establishment, hold, when full, 150,000 feet lumber, and are kept at a temperature of about 100° Fahrenheit, by means of steam from the boiler through pipes. As fast as one year's lot of lumber is taken down for use, another lot is put in its place. In this way we have a surety that none but the most perfectly seasoned and dry lumber is used in our piano-fortes. The constant supply of lumber on hand at all times is from two to three hundred thousand feet, and as Albany is the greatest lumber market in the world, of course we have the opportunity of selecting the choicest lots for our own use, and keeping our supply good at all times.

The selection of the proper kinds of lumber and its careful preparation, so as to be in the most perfect order, constitute one of the most important points in making piano-fortes that will remain in tune well, and stand any climate.

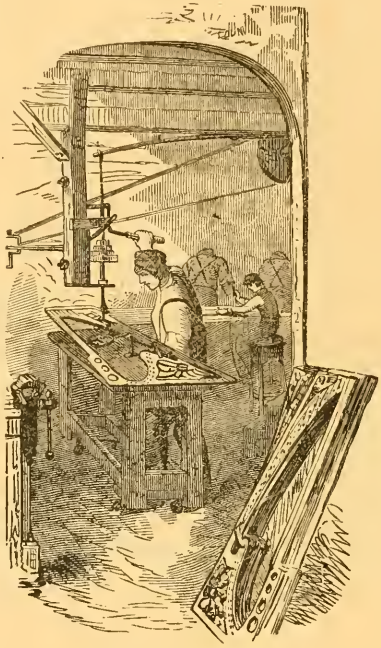


ENGINE AND BOILER.

Here is the motive power, and a beautiful Gothic pattern horizontal engine of *fifty horse power*, built at the machine works of Messrs. Townsend of Albany, from the plans and under the superintendence of *Mr. William McCammon.* The engine is indeed a beautiful working model, moving with its strong arm the entire machinery used throughout the building, yet so quiet that, without seeing it, you would hardly know it was in motion.

In the same room is the boiler, of the locomotive tubular pattern, large enough not only to furnish steam for the engine, but also for heating the entire factory, and furnishing heat for all things requisite in the building. Water for supplying the boiler is contained in a large cistern under the centre of the yard, holding some 26,000 gallons, supplied from the roofs of the buildings. The engine and boiler are in the basement (occupying the basement and first story in one room) at one end of the building, and are so arranged that all the machinery used in the different stories is driven throughout by long lines of shafting put up in the most finished manner, while the entire manufactory is warmed by steam from the boiler, passing through some 8000 feet of iron pipe, arranged so that each room can be tempered as required. At the same time ovens heated with steam through pipes are placed in the different rooms to warm the materials for gluing and veneering. The glue is all "made off" and kept hot in the different rooms by means of

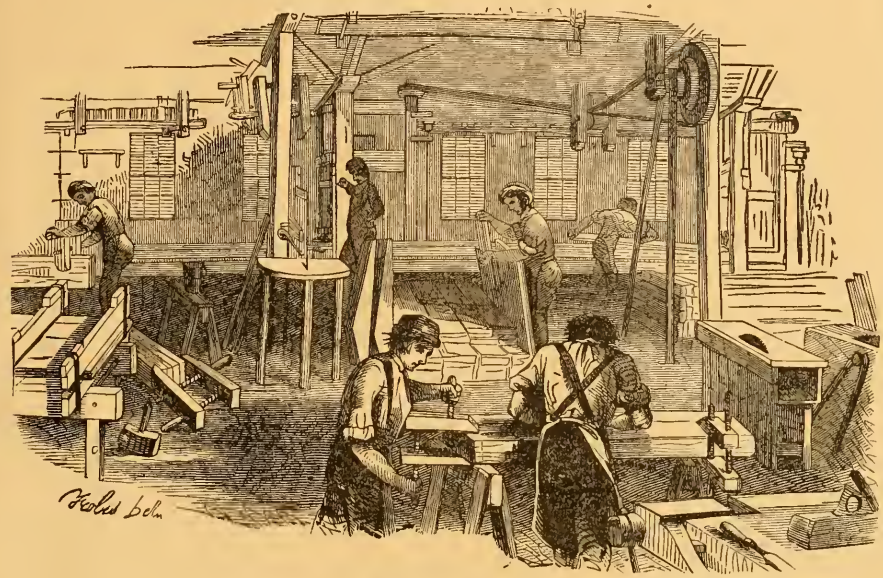
iron boxes, with water in them (in which the glue pots are placed), kept at the boiling point by steam passing through pipes in the water; thus the boiler furnishes all the heat required in the business.



DRILLERS' ROOM.

Passing to the next room, you will find the workmen employed in preparing the massive metallic (iron) plates used inside the pianos, from the rough state, as they come from the furnace. They are first filed smooth and perfect to the pattern, then painted and rubbed even and smooth, and are then ready for the drilling of the numerous holes for the pins and screws that have to be put into and through the plate in using it.

Into each plate for a seven octave piano, there have to be drilled upwards of 450 holes, and about 250 of these have pins riveted into them for the strings, etc., and these must be exactly in their places by a working pattern, for the least variation might make much trouble in putting on the strings and finishing the piano. Of course, these holes are drilled by machinery with that perfection and speed that can be done only with the most perfect machines and competent experienced workmen. And these metallic plates, when finished and secured in the instrument correctly, give a firmness and durability to the piano unattainable by any other method.



MACHINE SHOP.

Your first impression on entering the machine shop is one of noise and confusion; but on looking about you find all is order, each workman attending his own machine and work.

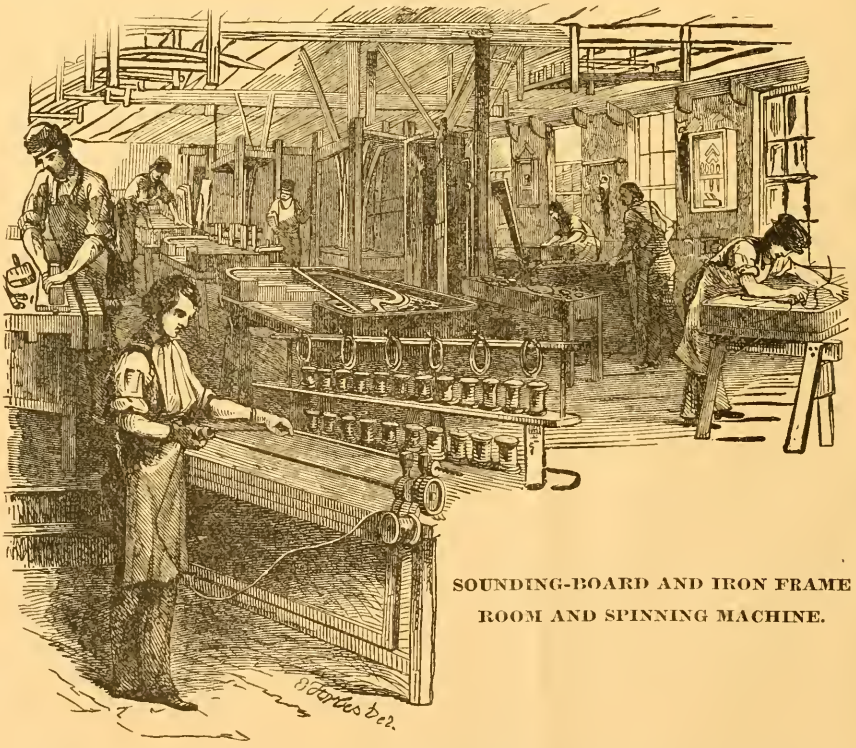
Here are two of "Daniel's Patented Planing machines," of the largest size, capable of planing boards or plank of any thickness three feet wide; two circular saws; one gig saw, for sawing fancy scroll-work; a "half lapping machine" for cutting the bottom frame work together. One band saw, turning lathes, and several other machines, all in full operation, making much more noise than music.

The lumber, after being cut to the length required, by the large cross-cut saw in the cellar, is brought into this machine room and sawed and planed to the different forms and shapes required for use, and is then ready for the drying rooms.

In this machine room, which is a very large one, the "bottoms" for the cases are made and finished, ready for the case maker to build his case upon. If you examine them, you will find they are constructed so as to be of great strength and durability; and, being composed of such perfectly seasoned materials, the changes of different climates do not injure them, and they will endure any strain produced by the great tension of the strings of the piano in "tuning up to pitch" amounting to several tons.

But pass on to the next room. You step on a raised platform about four feet by eight, and touching a short lever, find yourself going up to the next floor. Perhaps a lot of lumber is on the platform with you on its way to the drying-rooms. On getting on a level with the floor, you again touch the magic lever, and the steam elevator (or dumb waiter) stops, and stepping off, find yourself surrounded with workmen; and this is the "case-making" depart-

ment ; and here we find piano-forte cases in all stages of progress ; the materials for some just gathered together, and others finished or finishing ; some of the plainest styles, and others of the most elaborate carved work, and ornamental designs. Nothing doing but making cases ; two rooms adjoining, 115 feet long, with workmen all around, as close together as they can work with convenience. Each room is furnished with its steam ovens, glue heaters, &c. The case-maker makes the rims of the case, and veneers them. He fits and secures these to the bottom. He also makes and veneers the tops. This completes his work, and then you have the skeleton of a piano, the mere shell or box. The rim is securely and firmly fastened to the strong bottoms, bracing and blocking being put in in the strongest and most permanent manner, the joints all fitting as close as if they grew together ; and then the case is ready to receive the sounding-board and iron frame. The bottoms are made mostly of pine ; the rims of the case are of ash or cherry, or of some hard wood that will hold the rosewood veneers with which they are covered. The tops are made of ash or cherry, sometimes of mahogany, and veneered with rosewood. You will now follow the case to the room where the workmen are employed in putting in the sounding-board and iron frames.



SOUNDING-BOARD AND IRON FRAME ROOM AND SPINNING MACHINE.

The sounding-board is what, in a great measure, gives tone, and the different qualities of tone, to the piano. We use the beautiful white, clear spruce

lumber found in the interior counties of New York, which we consider in every way as good as the celebrated "Swiss Fir." It is sawed out in a peculiar manner, expressly for us, for this use, selected with the greatest possible care, and so thoroughly seasoned that there is no possibility of its warping or cracking after being placed in one of our finished instruments. The making of the sounding-board the requisite thinness (some parts require to be much thinner than others), its peculiar bracing, etc., are all matters that require great practical experience, together with numberless experiments, by which alone the perfection found in the piano-fortes of our make, their full, rich tone giving the most positive evidence of superiority, can be attained.

You will watch the processes of the workmen in this department. One is at work putting in the "long block" of hard maple, seasoned and prepared until it seems almost as hard as iron, which is requisite, as the "tuning pins" pass through the plate into it, and are thus firmly held. Another workman is making a sounding-board, another fitting one in its place, etc., etc. All the blocking being in the case, the sounding-board is fitted and fastened in its place, so as to have the greatest possible vibrating power, etc., and then the iron frame must be fitted over all and cemented and fastened down. The frame is finished, with its hundreds of holes and pins, in the drillers' room, and the workman here has only to fit it to its place and secure it there, and then the skeleton case is ready to receive its strings, and begins to look like what may make a piano-forte.

Spinning the bass strings, and stringing the case, come next in order. In the foreground of the last plate, you notice a curious looking machine, and a workman busy with it winding the bass strings, a curiosity to all who witness its operations. To get the requisite flexibility and vibration to strings of the size and weight wanted in the bass notes, tempered steel wire is used for the strings, and on this is wound soft annealed iron wire, plated with silver ; each string being of a different size, of course various sizes of body and covering wire are used in their manufacture. The string to be covered is placed in the machine, which turns it very rapidly, while the workman holds the covering wire firmly and truly, and it is wound round and covers the centre wire. This work requires peculiar care and attention, and like all the other different branches in our factory, the workmen here attend to but one thing ; they do nothing else but spin these bass strings, and string pianos year in and year out.

The case, while in this department, receives all its strings, which are of the finest tempered steel wire, finished and polished in the most beautiful manner. But a few years since, the making of steel music wire was a thing unknown in the United States, in fact, there were but two factories of note in the world which produced it ; but now, as with other things, the Americans are ahead, and the "steel music wire" made in the United States is far superior in quality and finish to the foreign wire. The peculiar temper of the wire has a great influence on the piano's keeping in tune, strings break-

ing, etc., and as the quality cannot always be ascertained but by actual experiment, much is condemned after trial, and the perfect only used.

KEY MAKERS' DEPARTMENT.

The preparation of what is termed the "key-board" is one of peculiar nicety, and the selection of the lumber and its preparation require great experience and minute attention, so that the keys will not spring or warp, and thus either not work or throw the hammers out of place, etc.

The frame on which the keys rest is usually made of the best of old dry cherry, closely framed together to the form required for the keys and action. The wood of the keys is usually of soft, straight-grained white pine, or prepared bass wood. Both kinds have to go through many ordeals of seasoning, etc., ere they are admitted into one of our pianos.

The keys are made as follows: On a piece of lumber the keys are marked out, and the cross banding and slipping done to secure the ivory; the ivory is applied and secured, and then the keys are sawed apart and the ivory polished and finished complete.

The ebony black keys are then made and put on and polished and the key-board is complete; the key maker has finished his part of the piano. The ivory used is of the finest quality, and an article of great expense; its preparation from the elephant's tusks, of sawing, bleaching, etc., is mostly confined to a few large dealers in the United States. As the ivory comes from them, it is only in its rough state, sawed out to the requisite sizes for use, after which it has to be seasoned or dried the same as lumber, and then prepared and fastened on the key; then to be planed up, finished and polished, all of which requires a great amount of labor, much skill and experience.

In this, as in other departments, each workman has his own special kind of work; nothing else to attend to but key-making; his whole energies are devoted to perfect this part of the instrument.

ACTION-MAKING MACHINE, Etc.

In this department, we again see the perfection of machine work. The action is one of the most important things in the piano-forte. On its construction and adjustment depends the whole working part of the instrument; for, however good the piano-forte scale may be, or how complete and perfect all the other parts are formed, if the action is not good, if the principle on which it is constructed is not correct, and the adjustment perfect, if the materials used are not of the right kind, of course the action will not be right, and it will either be dead under the fingers, without life and elasticity, without the power of quick repetition of the blow of the hammer, or soon wear loose, and make more noise and rattling than music. Thus will be seen the importance of not only having that action which is modelled on the best principle, but of having an instrument constructed is the most perfect and thorough manner. All parts of it should be so adjusted as to work together with as much precision as the wheels of a watch.

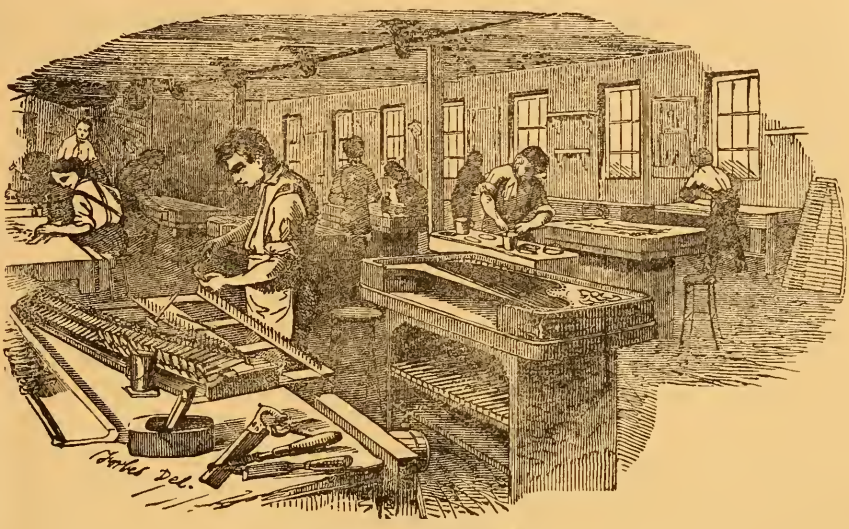
We use the principle which is termed the French Grand Action, with many improvements added by ourselves. This we have found from long experience to be the best in many ways. It is more powerful than the "Boston or Semi-Grand;" it will repeat with much greater rapidity and precision than any other; it is far more elastic under the manipulation of the fingers; and, to sum up all, it is almost universally preferred by professors and amateurs, and, what is still a very important point, they find after a trial and use of it for many years, that it wears well. What is technically called the action consists of the parts that are fastened to the key, and work together to make the hammer strike the strings of the piano when the key is pressed down. The parts made of wood, consisting of some eight or ten pieces to each key, are what compose the action-maker's work, and although they are each of them small, still on their perfection and finish depends much of the value of the instrument in which they are used.

Various kind of close-grained wood are used in their construction, such as white holly, apple or pear-tree, mahogany, hard maple, red cedar, etc., and other kinds as are best adapted to the use put to. They have to be closely

fitted; the holes for the centre pins to work in must be clothed with cloth prepared expressly for this work. Buckskin of a particular finish, and cloth of various kinds and qualities, are used to cover those parts where there is much friction or liability to noise, and every part so perfectly finished and fitted that it will not only work smoothly, and without any sticking or clinging, but without noise, and yet be firm and true, so that every time the key is touched the hammer strikes the string in response. The action-maker completes these different parts of the action; and then another workman, who is called the "finisher," fits them to the keys and into the case of the piano; but, before you enter into his room, you will see to the preparation of another important part of the action, namely, the hammer. This is another extremely important thing in piano-forte making; the covering of the hammers is one of the most peculiar branches of the business. It is one that long experience, and minute attention can alone perfect.

The hammerhead is made of bass wood, and then covered with felt prepared for this purpose. The upper hammers are covered with buckskin. The preparation of buckskin for piano-forte makers is at this time quite an important trade, and the improvements made in its dressing of late years have kept full pace with the other improvements in the piano. Those employed in covering and preparing hammers do this exclusively and must perfect their work.

We left the piano case in the hands of the persons employed in putting on the beautifully polished steel strings, whose vibrations may yet thrill many a heart, or bring many a tear. After it has its strings, it goes to the finisher, whose duties consist in taking the keys as they come from the key-maker, the action as prepared, and the hammers from the hammer maker, and fitting them together and into the case, so that the keys and action work together; adjusting the hammer to strike the strings, and putting the dampers in their proper places to be acted on by the keys and pedals; making and fitting the harp, a soft stop, adjusting the loading of the keys to make a heavy or light touch, and thus doing what may be termed the putting the machinery together to form the working part of the piano-forte. And, when you consider that each key in one of our pianos is composed, with its action, of some sixty-five to seventy pieces, and that there are eighty-five keys to a seven octave instrument, making a sum total of nearly six thousand pieces, and that many of these pieces have to be handled over many times before they are finished in the piano, one is not a little surprised at the immense amount of work in a perfect piano-forte. But these six thousand pieces only compose the key and action alone, and consist of wood, iron, cloth, felt, buckskin, and many other things; and, as a matter of course, each piece must be made and fitted with the greatest exactness, and the most perfect materials alone must be used.



FINISHING-ROOM.

The "finishing," it will be seen at once, is another important branch, and requires long experience, close attention, and workmanship. The work of finishing is done by the piece, as many of the different branches are under the personal superintendence of the foreman, whose duty it is to see that the work is made perfect; for the workman is liable for the materials he destroys.

When the case is thus finished, it can be tuned for the first time, although all is yet in the rough and unadjusted state; and from the finisher, after being tuned, it passes into the hands of the "regulator."

PIANO-FORTE ACTION REGULATOR.

The Piano-Forte Action Regulator adjusts the action in all its operations. Those parts are supplied and fitted that are still wanting to complete it. The depth of the touch is regulated, the keys levelled, the drop of the hammer adjusted, and all is seemingly in order for playing, but the instrument has to undergo another ordeal in the way of regulating ; for, after standing for several days or weeks, and being tuned and somewhat used, it passes into the hands of another and last regulator, who again examines minutely every part, readjusts the action, key by key, and note by note, until all is, as it were, perfect. And now its tone must be regulated, and the "hammer finisher" takes it in charge, and gives it the last finishing touch ; every note from the bass to the treble must give out a full, rich, even, melodious tone. This is a very important branch of the business ; for great care and much experience are required to detect the various qualities and shades of tone, and to know how to alter and adjust the hammer in such a way as to produce the desired result. Some performers prefer a hard or brilliant tone ; others a full soft tone ; and others, again, a full clear tone of medium quality. It is the hammer-finisher's duty to see that each note in the whole instrument shall correspond in quality and brilliancy with the others. *Our pianos are celebrated for their full organ tone, and for the even quality of each note, for the rich, full and harmonious music, rather than the noise, which they make; and a discriminating public have set their stamp of approbation on our efforts, if we may judge by the great and increasing demand for our instruments.*

The instrument, after being tuned, is ready for the wareroom or parlor. But several operations we have purposely passed by, as it was our wish to give a clear idea of the structure of the piano-forte by exhibiting, from stage to stage, the progress of the manufacture of the musical machinery. Let us now look after the construction of the other parts of the instrument.

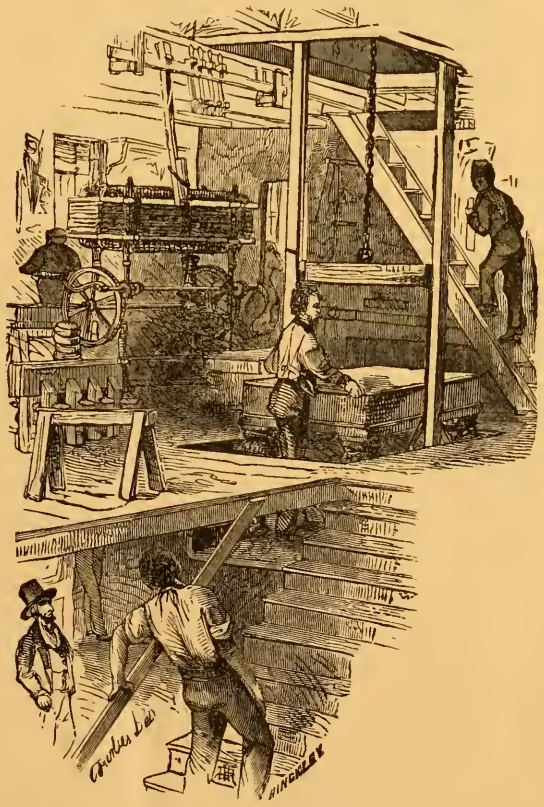
The desks are made by being so framed together as to give strength, then veneered, and after being varnished and polished are sawed out in beautiful forms and shapes by scroll saws, in the machine shop

They have thus to pass through quite a number of processes before they are ready to constitute a part of a finished piano-forte. The same can be said of many other parts of the instruments that are made separate and applied when wanted in the instrument, such as lyres, leg-blocks, or caps, etc. And, as each workman is employed at but one branch alone, and perfects his part, it is evident that, when put together correctly, the whole will be perfect. And, as we conduct our business, there are from twenty to twenty-four distinct kinds of work or trades carried on in our establishment. Thus the case-maker makes cases ; the leg-maker legs ; the key-maker keys ; the action-maker action ; the finisher puts the action into the piano ; the regulator adjusts it ; and thus each workman bends the whole of his energies and time to the one branch at which he is employed.

The result of this division of labor is strikingly shown in the perfection to which we have brought the art of piano-forte making, as may be seen by our superior and splendid instruments.

The putting together the different parts of the piano-forte, such as the top,

the legs, the desk, the lyre, etc., to the case, constitutes what is called fly-finishing. The top is finished by the case-maker in one piece, and remains so until varnished and polished; then the fly-finisher saws it apart, and applies the butts or hinges, so that the front will open over the keys; puts on all the hinges; hangs the front or "lock-board" to the top, and completes it. He also takes the legs as they come from the leg-maker, and fits them to the case by means of a screw cut on some hard wood, such as birch or iron-wood, one end of which is securely fastened into the leg, and the other end screws into the bottom of the piano. The fly-finisher also puts on the castors, locks, and all the finishing minutiæ to complete the external furniture of the instrument, when it is ready for the warerooms, to which it is next lowered by means of a steam elevator, sufficiently large to hold a piano-forte placed on its legs, together with the workman in charge of it



STEAM ELEVATOR.

The above plate exhibits a piano-forte on the elevator passing from the fly-finisher's department to the ware-rooms. Of these steam elevators there are two, one at each end of the building; one for passing workmen as well as lumber, to and from the machine shop and drying rooms, and one for passing cases and pianos up and down to the different rooms. Much ingenuity

is shown in their construction, being so adjusted as to be sent down or up by a person on either floor, or by one on the platform, who, going or stopping at will, thus saves an immense amount of hard labor.

Water from the Albany water-works is carried throughout the building on to each floor, with sinks, hose, and every convenience for the workmen, so that they may have no occasion to leave the premises, during the working hours.

Having thus given a passing glance at most of the mechanical parts of the piano-forte, we will now examine the varnishing and polishing departments consisting of some five or more large rooms. As the different layers of varnish require time to dry, it is policy to let the varnish harden while the workmen are busy putting in the various internal parts of the piano. Thus the case, when it comes from the case-maker, goes first to the first varnishing room, and receives several coats of varnish; and, when the workman is ready to put in the sounding-board and iron plate, it is taken from the varnish room to his department; and, when he has finished his work, it is again returned to the varnishing department, where it remains until the finisher wants it, who, when done with it, returns it to the varnishing room. Thus, these varnishing rooms are the store rooms for not only cases, but all the parts to be varnished; and the drying of the varnishing is going on all the time that the other work is progressing. In this establishment from 150 to 200 pianos are being manufactured in the course of each day. In the varnish rooms, from 100 to 150 cases are at all times to be seen; others are in the hands of the workmen in the different rooms, in the various stages of progress towards completion.

Besides the cases in the varnish rooms, we may see all the different parts of the pianos in dozens and hundreds, legs, lyres, tops, desks, bars, etc., etc., forming quite a museum in its way. The processes of varnishing and polishing are as follows: The cases, which are all of rosewood, are covered first with a spirit-varnish made with shellac gum, which drying almost instantly, becomes hard, and keeps the gum or pitch of the rosewood from acting on the regular oil varnish.

After the case has been "shellacked" it then receives its first "coat of varnish" and is left to dry; and then a second coat is applied, and again it is left to dry. The varnish used is made of the hardest kind of copal gum, and prepared for this express purpose. It is called scraping varnish; it dries hard and brittle, and is intended to fill in the grain of the wood. When it becomes thoroughly dry and hard, these two coats are scraped off with a steel scraper. The case then receives several coats of another kind of varnish; when this is dried it is ready for rubbing, which is effected by means of an article made of cloth fastened on blocks of wood or cork; and the varnish is rubbed on with ground pumice stone and water (a process somewhat similar to that of polishing marble). When the whole surface is perfectly smooth and even, it receives an additional coat of varnish. Each coat having become dry, hard and firm, the surface receives another rubbing, until it is

perfectly smooth, when it receives a last flowing coat. After it is thoroughly dried and hardened, it is ready for the polishing process, which consists in first rubbing the surface with fine rotten stone, and then polishing with the fingers and hands until the whole surface is like a mirror wherein we can

"See ourselves as others see us."

POLISHING AND RUBBING DEPARTMENT.

In the preceding statement, we have simply given an outline of the mechanical branches of the business, and a general description of the lumber required, and its peculiar seasoning and preparation prior to use. Large quantities of rosewood are used for veneering and carved work, slipping, etc. Just now, this is the fashionable wood for furniture, nothing else is used in the external finish of our pianos.

A view of our large veneer room would excite the astonishment of the novice.

Rosewood is brought from South America, and is at present a very important article of commeree, a large number of ships being engaged in this trade alone, to say nothing of the thousands employed in getting it from its native forests for shipping, and the thousands more busy in preparing it for the market after it has reached this country.

We buy large quantities at a time, and, of course, have a large supply on hand ready for immediate use. We always select the most richly-figured wood in the market, believing that rich music should always proceed from a beautiful instrument.

Thick rosewood is constantly undergoing seasoning for those portions which require solid wood. And one thing, we would say; and that is, where rosewood veneers are put on hard wood well seasoned, and prepared correctly, they are much more durable than the solid rosewood would be, not being so liable to check and warp.

We also make use of a large quantity of hardware in the form of "tuning pins." Of iron plates we use tons. Each piano requiring a plate 145 pounds in weight. The outlay for steel music wire amounts to hundreds of dollars per

year; not to speak of the locks, pedal feet, butts and hinges, plated covering wire for the bass strings, bridge pins, centre pins, steel springs, and screws of various kinds and sizes, of which we use many thousand gross annually. Of all these, we must keep a supply constantly on hand, as it will not do for our work to stop for want of materials. A large capital is at command at all times; and as many of these things require to be made expressly to order, calculation, judgment, and close attention are needed to keep all moving smoothly on. Cloth is used for a variety of purposes. It is made and prepared expressly for piano use, from fine wool, of various thicknesses and colors, according to the use for which it is designed, whether its texture be heavy or thick, firm or loose, smooth or even, soft or hard, every kind has its peculiar place and use.

Here we would give a word of caution to the reader. So much cloth is used in and about the action of the piano-forte that you must beware of the insidious moth, which will often penetrate and live in its soft folds, thereby doing much damage to the instrument. A little spirits of turpentine, or camphor, is a good protection against them.

Ivory is another article which is largely used. Being expensive, no little capital is employed in keeping an adequate supply at all times on hand.

And then there is buckskin of various kinds and degrees of finish, sand paper, glue, and a variety of other things, all of which are extensively employed in the business.

So far, we have treated merely of materials and labor. We have said nothing of the science of piano-forte making. If, after all the pains taken in selecting and preparing the materials required, the scale of the instrument shall not be correctly laid down on scientific principles; that is to say, if the whole is not constructed in a scientific manner, we shall not have a perfect musical instrument. So the starting point in making a piano-forte is in having a scale by which to work. This scale must be of the most improved pattern, and laid out with the utmost nicety, and with mathematical precision. By the scale, we mean the length of each string, and the shapes of the bridges over which it passes. The length of the string for each note, and its size, are calculated by mathematical rules, and perfected by numerous experiments; and by these experiments alone can perfection be attained in the manufacture of the instrument. We use new and improved scales of our own construction, in which are embodied all the improvements which have from time to time been discovered.

And now, we have attempted to show you how good pianos are made; to give you an idea of the varied materials which are requisite for this purpose, and to describe the numerous processes to which they are subjected before a really perfect instrument can be produced.

The manufacturer's department is under the immediate supervision of Mr. Edw. McCammon who gives his time personally to the business. He selects and purchases all the materials used in the establishment. No piano-forte is permitted to leave the concern until it has been submitted to his careful inspection. If, on examination, an instrument proves to be imperfect, it is

returned to the workman to remedy the defect. He is constantly introducing improvements and producing new patterns and designs, to keep up in all things, with the progress of the age.

WAREROOMS.

The piano-forte was formerly an expensive article of luxury, and, as such, but little known or appreciated. But with the advancement of science and art, the introduction of vocal and instrumental music in our common schools, the diffusion of general musical knowledge among the masses, and the consequent elevation and refinement of taste, this noble instrument has risen in public favor, until scarce a parlor is destitute of this grand embodiment of a full orchestra, which Godey, of the every-where-known *Lady's Book*, in speaking of the McCammon piano-fortes, so aptly styles "*a household friend.*" It is, therefore, of much real importance that those who wish to purchase a superior instrument should be well informed in regard to the necessary qualities of a good piano-forte. If this be not the case, they are liable to imposition in the purchase of a worthless instrument, of which there are many continually in the market, whose fanciful exterior can no more compensate for the lack of good musical qualities than a pleasant countenance can make amends for a corrupt heart or a shallow brain!

There are four indispensable requisites in a piano-forte, without which it can be of little value, viz., *Power and Volume of Tone — Pure Quality of the same — Perfect Action — and Durability.* If either of these essentials be to any considerable extent lacking, the other qualities of the instrument are necessarily sacrificed to this one defect.

We may also add, as eminently desirable, *elegance of style* and *a size well adapted to the room for which it is designed.* Hence, it is plain to any mind that those manufacturers who most successfully combine all these elements, succeed in producing the best and most desirable piano-forte.

A piano may possess every requisite in respect to tone and action, and yet be undesirable on account of its unwieldy and inconvenient bulk. Another may be unexceptionable in all these points, and still, from the lack of proper care in the selection and preparation of materials, or the want of experience and thorough workmanship in its construction, may in a few months become nearly useless from the effect of variations in temperature, or a change of climate.

The McCammon piano-fortes have been long celebrated for combining in a remarkable degree the requisites mentioned, and a fair trial of them cannot fail to show the justice of this reputation. The tone of these instruments is clear, rich and powerful, and the action of unequaled perfection; while the cases are constructed not less with a due regard to economy of space than to an elegant and tasteful style. A glance at the immense and well arranged manufactory of Ed. McCammon reveals the secret of their success, possessing ample means with which to avail themselves of every important advantage in the selection of the choicest materials, and securing the services of the most skillful and faithful workmen.

Our motto is "*Excelsior*," in accordance with the spirit of which we are constantly studying how any farther advance may be made towards perfecting the superb instruments which we produce.

DIRECTIONS TO UNBOX AND SET UP A SQUARE PIANO-FORTE.

Take the top of the box off carefully; then take everything out of that end of the box where the legs are; carefully remove the cross board that keeps the legs, etc., from coming in contact with the piano; remove all the cleats or strips of boards put in to keep the piano from sliding in the box; after these are taken out, the piano can be moved along towards the middle of the box, and two persons, standing in the box, can lift the piano out, taking hold under the ends. Next, put the instrument on its back, on a box or stools, so that the boards fastened across its bottom can be removed, and the legs, lyre, pedal rods, etc., put on accordingly as they are numbered, screwing the legs on firm. so that their flat faces will be square with the front and ends of the piano-forte. When all is right, *lift* the piano on its legs.

TO UNBOX AN UPRIGHT PIANO.

Take the back off the box, and *carefully* draw the piano out, using care not to rub the sides of the case.

INSTRUCTIONS.

Have your piano-forte tuned, at least four times in the year, by an experienced tuner. If you neglect it too long without tuning, it usually becomes flat, and troubles a tuner to get it to stay at concert pitch, especially in the country. Never place the instrument against an outside wall, or in a cold, damp room. Close the instrument immediately after your practice. By leaving it open, dust fixes on the sound board and corrodes the movements; and, if in a damp room, the strings soon rust.

Should the piano-forte stand near or opposite a window, guard, if possible, against its being opened, especially on a wet or damp day; and when the sun is on the window, draw the blind down. Avoid putting metallic or other articles on or in the piano-forte; such things frequently cause unpleasant vibrations, and sometimes injure the instrument. The more equal the temperature of the room, the better the piano will stand in tune.

OUR "NEW SCALE" UPRIGHTS

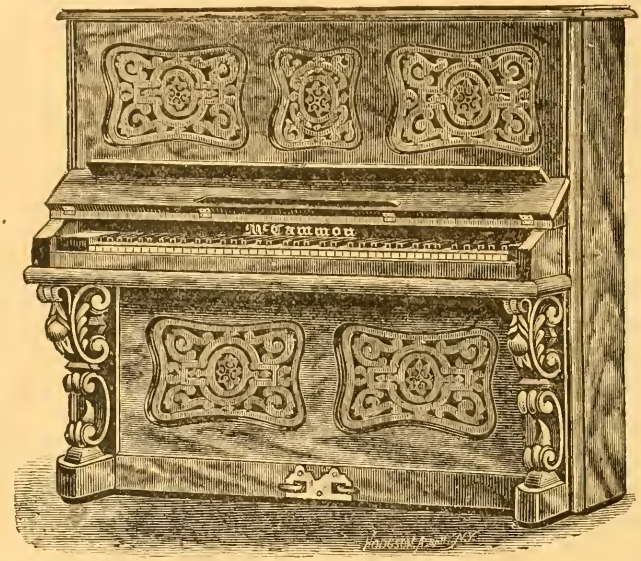
HAVE NO SUPERIOR IN THE MARKET.

WE make *no vain boast* when we say we have produced an ***Upright Piano,*** which for FULLNESS OF TONE THROUGHOUT, DELICACY OF TOUCH, and BEAUTY OF FINISH, has *never been equaled* by any other manufacturer; and all we ask is to place them *side by side with any other make and give them the most severe test.* We have produced a "BASS" *equal to any square*— the "TUBBY" tones always found in the lower notes of the Upright are *entirely done away with* in the *"NEW SCALE" McCAMMON UPRIGHT.*

The McCAMMON UPRIGHTS can be *taken apart* — the *entire case coming off* — thus enabling the Piano to be *taken through a space* 18 *inches in width.* The *entire action* and *key board come out in one piece.* All Uprights have the new style TOE PROTECTORS, thus preventing the performer from *marring the case* with the foot. STYLE B has the NEW DESK *formed from middle panel,* (pat. apld. for,) altogether making one of the MOST PERFECT UPRIGHT PIANOS that has *ever been produced.*

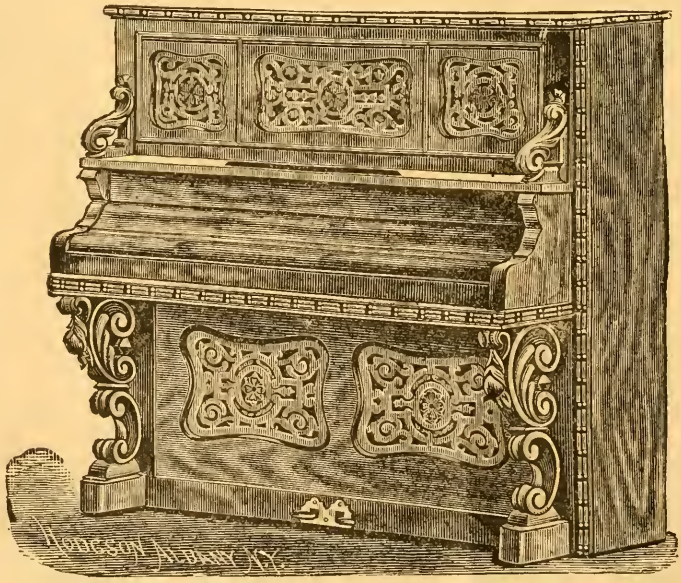
We will *not allow* an INFERIOR PIANO to leave the factory. EVERY PIANO is *subjected to the most rigid test,* and we *fully warrant* each and every Piano for *five years.*

The SOUND-BOARD is of *new principle,* and produces a tone unequaled by any Upright, we care not of what make.



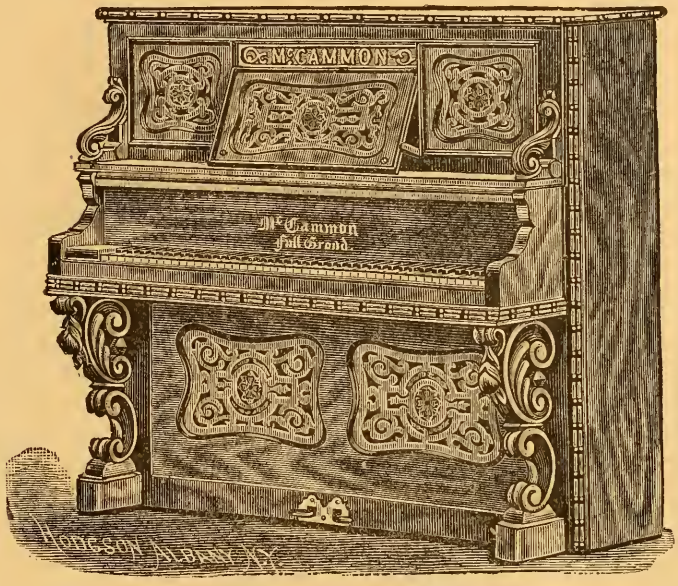
STYLE A — UPRIGHT.

7⅓ **Octaves** — Rich Rosewood Case; Overstrung Scale; Three Strings throughout; Patent Action; height, 4 feet 8 inches **$850**



STYLE B AND VICTORIA GRAND — CLOSED.

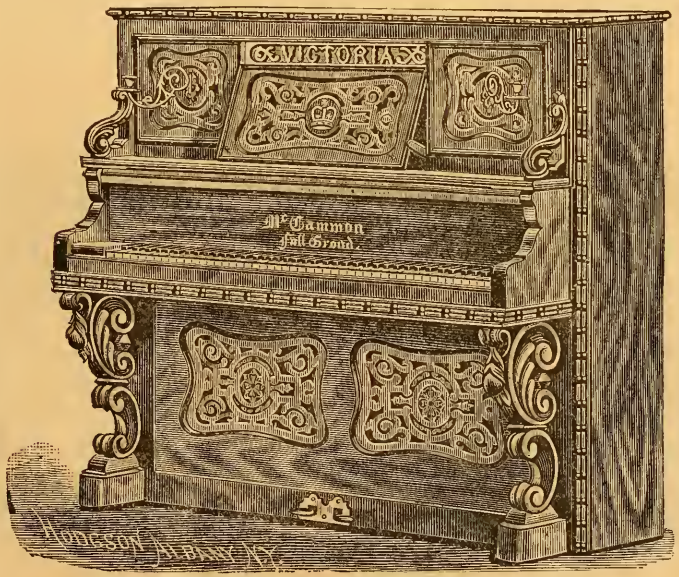
This cut is to show the working of New Music Desk, formed from Middle Panel, (pat apld. for.) Also, Grand Rolling Lock Board.



STYLE B—UPRIGHT.

7⅓ **Octaves**—Extra Handsome Rosewood Carved Case; Three Strings throughout; Patent Action; also, New Desk, formed from Middle Panel, (pat. apld. for;) Grand Rolling Lock Board; height, 4 feet 8 inches; width, 5 feet 3 inches..... **$950**

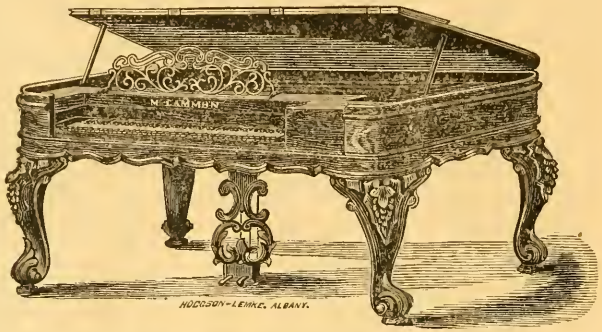
Ebonized and Gold, with candlesticks, same price. French Walnut Cases, $25 extra.



Victoria Upright Grand.

7⅓ **Octaves**—Extra Handsome Rosewood Carved Case, with Gilt Candlesticks; also, Crown of England elegantly painted on Middle Panel; Three Strings throughout; Patent Action; New Desk, formed from Middle Panel, (pat. apld. for;) Grand Rolling Lock Board; height, 4 feet 8 inches **$1000**

French Walnut, $25 extra.

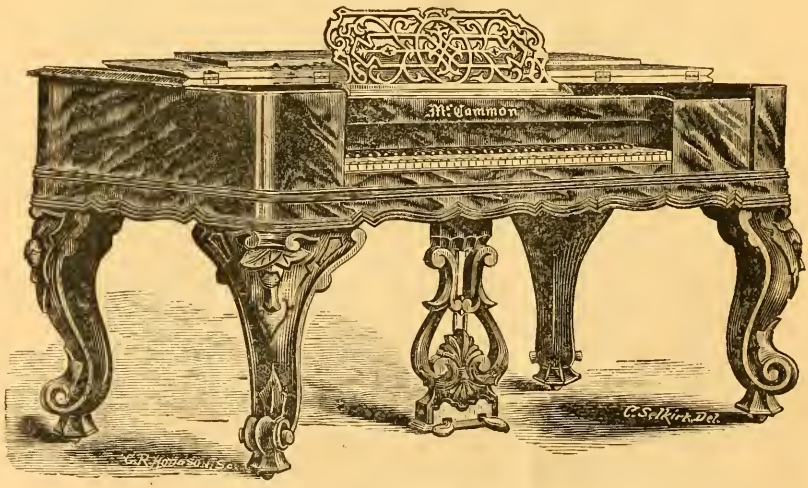


The "Little Beauty."

All Round Corners.—Rosewood Case.

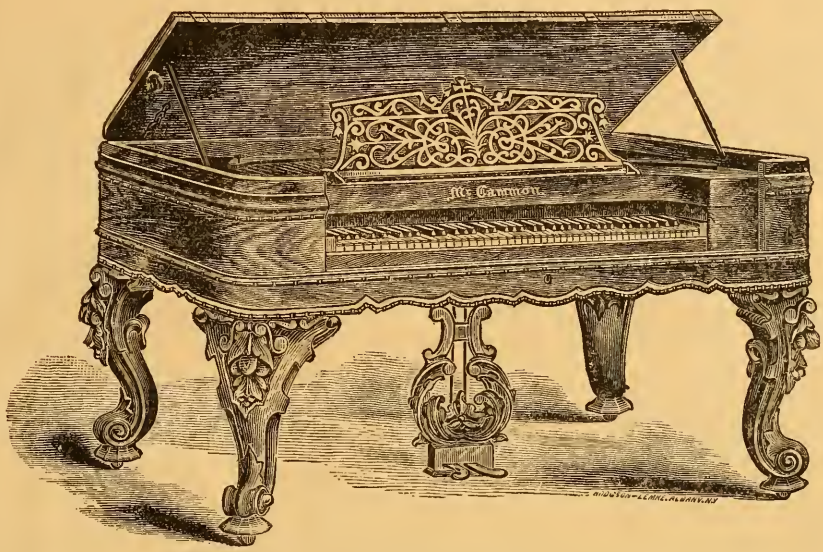
7 Octaves (patent iron rim) C to C scale; 6 feet long, 2 feet 11 inches wide,..... **$600**

Especially adapted for small parlors and sitting rooms. The construction of this Piano is such that it requires but little tuning, it having the patent insulated iron rim and frame.



No. 2.—Front Round Corners.

7⅓ Octaves, Grand Square (3 string unisons; full Agraff); E egant Rosewood Case; Serpentine and Plynth Moulding; Elegant Carved Legs and Lyre..... .... **$800**



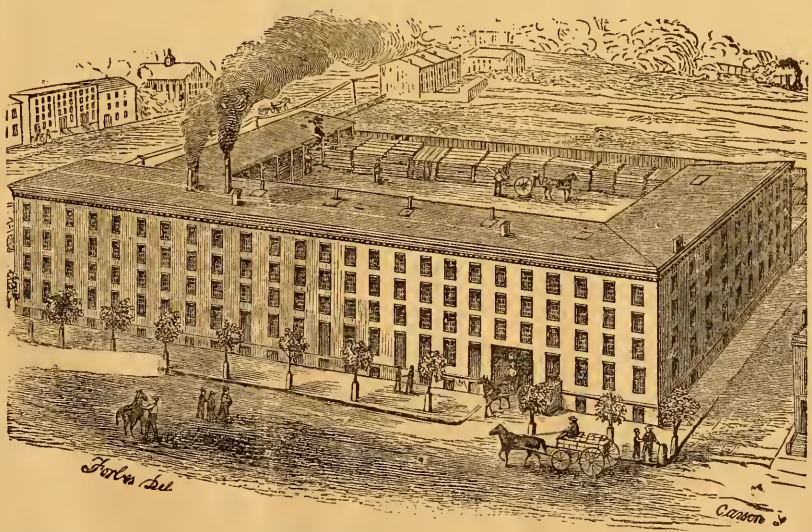
No. 3.—All Round Corners.

(Size—6 feet ten inches long, 3 feet 5 inches wide.)

7¼ **Octaves, Grand Square** (3 string unisons); full Agraffe; Rich Rosewood Case; Heavy Carved Mouldings; Case, Legs and Lyre Elegantly Carved **$900**

This Piano has every improvement known to piano makers. For elegance of finish and quality of tone, it has no superior in the market.

UPWARDS OF 12,500 ARE NOW IN USE.



BIRD'S EYE VIEW OF THE FACTORY.

FORTY-FIVE FIRST PREMIUMS, GOLD AND SILVER MEDALS AND DIPLOMAS, AWARDED THESE PIANO-FORTES.

TESTIMONIALS.

FROM "AMERICA'S QUEEN OF SONG."

Mr. McCAMMON: NEW YORK CITY, *September*, 1880.

DEAR SIR. — Please allow me to express my admiration for your magnificent Upright Pianos, which I have used since my return from Europe.

They have an astonishing fullness and wealth of tone and perfect easiness of touch. There can hardly be found an instrument which is more adapted to the voice, from its unexcelled musical qualities. In every way do your pianos fully deserve the great success to which they have attained. Accept my best wishes.

Very truly yours, LETITIA LOUISE FRITCH.

DEAR SIR. — I have been playing on one of your Upright Pianos for several nights. It gives me great pleasure to certify that it is, in my opinion, one of the best of its kind. It is equal to the best.

Respectfully, C. V. SCHILLER,

MAHN COMIC OPERA TROUPE. *Operatic Conductor.*

QUEBEC, CANADA.

GENTLEMEN. — It is with pleasure that I bear testimony to the excellent quality of the McCammon Pianos. Both as regards tone, general excellence and durability, I think they stand unrivalled. I can, without hesitation, recommend them as a first-class instrument. Yours respectfully, JOHN MERCER,

Organist St. James Hall, Quebec.

CUSTOM-HOUSE, SAN FRANCISCO, CAL.

GENTLEMEN. — I am so very well pleased with the instrument received from your house that I cannot refrain from expressing my thanks and saying that I shall be pleased to recommend your pianos to my friends.

I am yours, P. H. BELLINGALL,

Deputy Surveyor Customs, San Francisco, Cal.

OTTAWA, ONTARIO.

GENTLEMEN. — I have much pleasure in stating that I have had frequent opportunities, during the past nine years, of testing the qualities of the piano-fortes manufactured at the establishment formerly conducted by Messrs. Boardman & Gray, and now by Mr. McCammon, and have no hesitation in bearing testimony to their great brilliance of tone, pleasant touch, and in all cases that have come under my observation, extraordinary durability under constant use.

Yours truly, H. R. TRIPP,

Organist Christ Church, Ottawa, Ont.

E. McCAMMON: 1129 CHESTNUT STREET, PHILADELPHIA, PENN.

Dear Sir. — I am very much obliged to you for your kindness in sending me a very handsomely embellished upright piano (style B, French walnut) in a beautiful fancy case, for our Pennsylvania State fair. The tone and workmanship of it have been universally admired

Your upright pianos are extraordinarily fine; they have a power which is seldom found in any upright piano, and every customer to whom I have sold one of them recommended it to all his friends. I feel confident that the sale will greatly increase. Hoping that our business connection may continue for the future as it did during the past. Yours, JAMES BELLAK.

FROM WM. A. POND & CO., MUSIC PUBLISHERS.

E. McCAMMON: 25 UNION SQUARE, NEW YORK CITY.

We have been selling and renting pianos of your manufacture for some years past, and are pleased to say that, in the numerous tests to which they have been submitted by us, whether with professional or amateur performers, they have proven to be very excellent instruments, both as to tone and durability.

Wishing you every success, we are

Yours very truly, WM. A. POND & CO.

E. McCAMMON, *Albany.:* PITTSBURGH, PA.

DEAR SIR. — Your Upright Piano is all you said it was. It is remarkably fine. We were all surprised at its excellencies.

Yours truly, H. KLEBER & BRO.

TESTIMONIALS.

FOREIGN TESTIMONIALS.

CHARLES HALLE, the eminent German Composer and Pianist, favors us as follows :

LIVERPOOL.

GENTLEMEN : I have examined with care the piano that you desired me to look at, at your rooms in London, and it is with great pleasure that I say I have been perfectly satisfied ; as much with the tone, which is fine and very powerful, as with the touch, which is equal and easy. * * * * * * * * I beg of you, gentlemen, to receive my sincere compliments, and at the same time my thanks for the pleasure it has afforded me. I remain, etc., etc.,

CHARLES HALLE.

JULES BENEDICT, the eminent Composer and Pianist to Jenny Lind, and also to the Queen of England, writes us the following :

LONDON, MANCHESTER SQUARE.

GENTLEMEN : Regarding my opinion of your piano-forte, * * * * I beg first to express my entire satisfaction as to the excellence of the instrument for elegance, quality of touch and firmness of tone ; the whole being a very good specimen of American taste and workmanship. * * * * I trust its introduction into this country may meet your expectations, and I have much pleasure in adding my opinion to the many you have already received. I am, gentlemen, your most obedient servant,

JULES BENEDICT.

JENNY LIND, that "Queen of Song," writes as follows :

GENTLEMEN : It gives me much pleasure to speak in favor of your piano-fortes, which have been used by me at different times during my stay in this country. I have every reason to be satisfied with their quality and excellence of tone, and hope they will continue to receive the patronage of the public they so well deserve. I remain, gentlemen, yours, truly obliged,

JENNY LIND,
New York.

THALBERG'S CONCERT IN ALBANY.

Thalberg used on this occasion, and also the next evening at Troy, one of the new Grand pianos, and repeatedly expressed himself as delighted with it, both in tone and touch. At the close of each concert, he found the instrument in complete tune *without even an imperfect unison.— New York Musical Review.*

L. MOREAU GOTTSCHALK'S OPINION.

He again and again expressed his delight at the firmness, sweetness and tone of the instrument, and seemed to take pleasure in sweeping its beautiful, responsive keys.— *Extract from a letter of* A. McMAKIN, *Editor of the "American Courier," Philadelphia, Pa.*

URSULINE CONVENT, SAN ANTONIA, TEXAS, Jan 21, 1867.

Mr. WM. McCAMMON, Albany, N. Y. :

Kind Sir — With sentiments of respect and gratitude, I address you a few lines to announce the safe arrival of the pianos, and also my great satisfaction. I am much pleased with the sweet tones of the pianos, as well as with the workmanship, and feel myself greatly obliged to you for your charitable and generous offering. I present you my sincere thanks for the great reduction you have made in the price of the pianos. Permit me to give you a place among the number of our kind benefactors, for whom our daily prayers ascend to obtain all necessaries, spiritual and temporal.

Yours, very respectfully,
SISTER ST. Z. DE CHANTAL, Superioress.

ST. PETER'S HOSPITAL, ALBANY, Jan. 25, 1874.

Mr. WM. McCAMMON :

Dear Sir — Permit me to express my entire satisfaction as to the excellence of your pianos. I am pleased with their power and sweetness of tone, also their durability, as we have tested them in our schools in Greenbush and Troy. Yours very truly,

SISTER M. PAULA.

CONVENT OF MERCY, GREENBUSH, Feb. 19, 1874.

Mr. WM. McCAMMON :

I take pleasure in stating that I am exceedingly pleased with your pianos, which give us the greatest satisfaction. Yours, most respectfully,

MOTHER M. VINCENT.

JAMES W. PORTER, the eminent Composer, writes us :

GENTLEMEN : Having been engaged in the various branches of music, mechanical as well as professional, for a number of years, I must take the liberty of tendering to you my high appreciation of your late "manufacture of piano-fortes" with the improved scale. I would also take this opportunity of recommending to all, about to purchase an instrument, the great superiority of your pianos over "all" others, for tone, workmanship and durability, as well as being a magnificent parlor ornament.

Yours truly,
JAMES W. PORTER,
Philadelphia, Pa.

CARL DE BUBNA, the eminent Composer, writes thus :

GENTLEMEN : Having carefully examined the new piano with your latest improvements, I have come to the conclusion, in regard to touch, equality of tone (and in particular the highest octaves, which have a bell like sound), beauty of style and finish, they combine more excellence than any other piano-forte with which I am acquainted. I congratulate you on your success, and hope that all your pianos will turn out as good as those I have seen. Very truly yours,

CARL DE BUBNA,
Philadelphia, Pa.

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